

BEETLE ECOLOGY (4)

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(Continued from Vol. III, p. 3)

More attention is now being given to the bionomics and systematics of the larval stage but we have not yet sufficient recorded data for any comprehensive bonomic classification, and still less in regard to the egg and pupal stages. The bionomics of the adults, as would be expected, are much more advanced and the position has been reached at which at least a preliminary bonomic classification can be drawn up. An attempt has recently been made in this connection in regard to the British beetle fauna in my Field Book of Beetles which, whilst only of an introductory nature, nevertheless applies the ecological data in the practical form of a bonomic key to the species covered. This work was made possible through the more extended knowledge of environmental data, including reliable information upon host plants and natural habitats referred to in an ever increasing number of recorded field observations now appearing in the literature attaching to faunistic and other aspects of coleopterological work.

It is only in comparatively recent years, however, that such ecological information has been included in the published results, and there is not yet a sufficient knowledge of the bionomics of any country's beetle fauna to cover more than a fraction of the indigenus species. It is for the beetle ecologist to supply more fully documented records of his field observations and captures, and the following list of the more important data attaching to each may be taken as a guide to the required information.

Schedule of Field Data. Specimen No.

1. Locus (General): County, Department or State, and Country.
2. Locus (Particular): Place nearest named Village, District and Town.
3. Date: Day, month and year.
4. Time Adopting 24 hour clock and referring to standard e.g. G.M.T.
5. Altitude.
6. Season: Spring, summer, autumn or winter.
7. Temperature: Actual, also reference to summer and winter maximum and minimum ranges.
8. Humidity: General note on humidity range of locus.
9. Weather condition: General at time of capture.

10. Geological formation of locus: Surface soil and rock foundation.
11. Plant ecology: Nature of plant community of locus.
12. Host: Kind of plant, moss, fungus, carrion, etc.
13. Host condition: Age and condition.
14. Position in relation to host.
15. Description of habitat.
16. Position in relation to habitat.
17. Plant and animal associates.
18. Parasites and/or predators.
19. Behaviour: Description of attitude before disturbing and note of nature of any movement exhibited.
20. Aquatic species: Type of habitat general. Type of water: fresh, salt, brackish, impure, stagnane, flowing, etc.
21. Miscellaneous additional field observations.
22. Specimen name and/or reference number, the latter being the number on the container of the specimen and also in the field note-book containing the information gathered for this schedule.
23. Name of collector/observer.

With completed schedules written upon the above lines in regard to all the special recorded within a particular geographical area it would be possible to draw up a workable bionomic key, classifying groups of species according to their natural habitats and reducing these groups to still smaller divisions according to such factors as host preferences, altitude, etc. A stage is reached, however, when the more usual characters of structure, colour and size, can with advantage be brought into use for the final differentiation of the species reduced to the lowest bionomic division.

Whether or not the collector of beetles in the field intends to utilise the fullest possible ecological data himself, it should always be provided by him, if not for his own use then for the advantage of subsequent work upon the specimens in question. This entails the accurate referencing of the notes to the actual whereabouts of the specimens to which they attach so that the materials can be reexamined at any time by future workers.

It has been due solely to the paucity of ecological detail attaching to the specimens which form the bulk of present and earlier collections of beetles that the systematics of the coleoptera have taken the form in which they are presented throughout almost the whole of the systematic literature of the order. In other words, those who have

concerned themselves with the erection of classifications, have in the past, had little else apart from the specimens themselves, upon which to base their views, and thus the nature of the actual structure of the anatomical divisions of the insect has become the comparison index for the assessment of evolutionary relationships.

We can perhaps gain here a glimpse of the additional value to the advancement of natural science which may follow from the above suggested ecological approach, for in possession of so greatly extended initial data intimately concerning the beetles studied, it would be strange if the conclusions we should then be in a position to draw upon the mode of life of the various species and the evolution of the order were not of much greater significance to us than heretofore.

(*to be continued*)

AMPHIZOID COLLECTING

By WILLIAM MASON

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The Amphizoidae are a small family of aquatic beetles restricted to the boreal zones of our western mountain ranges and western Tibet. They are generally rare in collections but really surprisingly common when one knows their habitat. This summer I had the fortunate experience of finding large numbers of them in northern British Columbia and Yukon Territory. Adults and larvae are both inhabitants of trash that accumulates in eddies and plunge pools of small mountain creeks. The simplest way to catch them is to push handfuls of trash and gravel from about the waterline into the eddy pools. The adults, being exceedingly buoyant, pop to the surface and may easily be picked out, while the larvae sink slowly toward the bottom. It is interesting to note that I developed this technique independently, later discovering the paper by Darlington who used much the same methods twenty years ago.

DARLINGTON P. J., 1929, *Psyche*, 36:383; (Biol.)

VAN DYKE, E. C., 1927, *Pan-Pac. Ent.*, 3:197; (Key, Des.)

MAILING DIFFICULTIES

Volume III, number 1 of the Bulletin was mailed on February 23, 1949. All copies were mailed at once at the same post office. However, the majority of these copies were delayed for nearly a month by the Post Office Department at some distribution center. A check is being made by the Superintendent of Mails, but to date, the Editor has